

## ASTRONOMY

**Nearby Stars Yield "Fossil Record"**

► A "FOSSIL RECORD" has been discovered that may hold the key to determining the rate at which stars are formed in the Milky Way galaxy of which the sun and its planets are a part.

The record was found in a group of unspectacular nearby stars by the astronomer, Dr. Olin C. Wilson of Mt. Wilson and Palomar Observatories, Pasadena, Calif. The stars are small, comparatively cool, stable and very slowly evolving. Dr. Wilson studied photographs of their light as spread out by the device known as a spectroscope.

Although all the stars whose light he examined are within 30 light years, or about 180 trillion miles, of the earth, only a few are bright enough to be seen with the unaided eye.

Because all of them are in the early stages of stellar evolution and are of similar type and size, they were believed to be of similar age. But Dr. Wilson found evidence suggesting that there are great differences in their ages, perhaps several billion years.

They can be of differing ages and at the same time be in the early stages of evolution, because, although smaller than the sun, the temperature and pressures within these stars are comparatively low. As a consequence, the nuclear fires that determine their rate of evolution burn very slowly, Dr. Wilson reports in the *Astrophysical Journal*, 133:457, 1961.

The older ones age so slowly they do not show it, remaining in what Dr. Wilson calls "mint condition."

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## ROCKETS AND MISSILES

**Suburb Has Largest Field Free From Magnetism**

► A WASHINGTON SUBURB boasts one of the world's largest fields free from magnetism, a testing ground for magnetism and radiation measuring United States satellites.

The field, part of the magnetic research area of the U. S. Naval Ordnance Laboratory, Silver Spring, Md., has been used recently to check out the S-3 energetic particles satellite, first piece by piece and finally as an assembled unit.

A project of the National Aeronautics and Space Administration, the S-3 is designed to measure the earth's magnetic fields and the cosmic rays and energetic particles trapped in the Van Allen radiation belts encircling the earth.

The accuracy of these measurements by the satellite cannot be assured until its own built-in magnetic influences, such as those created by its electronic system, have been precisely measured.

The magnetic measurements on the S-3 were made at the Ordnance Laboratory in a specially designed building as free from magnetism as scientists can make it. It is constructed entirely from such non-magnetic materials as wood, building mortar from which the sand was screened to exclude minute particles of iron oxide,

plastic floor drains, aluminum light switches. The nails holding the isolated structure together are copper.

The natural terrestrial magnetic field is cancelled out to create a complete non-magnetic area by sending electrical current through a system of coils constructed in the building's walls.

Final tests of the S-3 will include calibration of the satellite's magnetometer, a magnetic-measuring probe extending about three feet from the vehicle's body.

When launched this summer, the S-3 will be in an eccentric orbit varying from 150 to 40,000 nautical miles from the earth. On its outward swing away from earth, the S-3 will travel far enough for its measuring probe to be clear of the Van Allen radiation belts and magnetic influence so that another "clean-measuring sweep" can be made.

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## GENETICS

**Intelligence Is Result Of Chemical Products**

► INTELLIGENCE is the product of many chemical processes, all under genetic control, Dr. Barton Childs of Johns Hopkins University School of Medicine said at the meeting of the American Academy of Pediatrics in Washington, D. C.

But relatively little is known about genetics in intelligence, the pediatrician said. "Genes don't determine the characteristics of what we can study directly. We need some means of measurement."

All intelligence tests have faults, Dr. Childs said. There are sex differences in the results of the tests, partly because they have been devised by men. If women had devised the tests, they might be different.

People tend to marry people of equal intelligence and adopted children have IQ's, or intelligence quotients, like their foster parents rather than their own parents. There is an admixture of cultural influences on intelligence.

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## PSYCHOLOGY

**Sugarless Sweetener Changes Blood Sugar**

► WHEN YOU EAT a sugarless sweetener it may have an effect on the sugar level in your blood. The action is psychological, not just chemical, Dr. Albert A. Branca of the University of Delaware reported to the Eastern Psychological Association in Philadelphia.

The explanation, he said, is conditioning. When you become accustomed to experiencing a sweet taste when you eat sugar, the sweet taste alone becomes enough to set in motion the physiological events that ordinarily follow eating sugar. Insulin is released in the body. There is greater utilization of glucose and decreased glycogen breakdown. The end result is a lowering of blood sugar. Thirteen out of 14 normal students studied by Dr. Branca had lowered blood sugar after drinking a solution of sugarless sweetener.

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**IN SCIENCE**

## OCEANOGRAPHY

**Ocean-Bottom Layer Thinner Than Estimated**

► THE SOFT sediments resting on the ocean floors may be much shallower than scientists once believed.

Measurements taken while drilling through the soft layer show that its average estimated thickness of 550 feet is too high, Willard Bascom, project director of the Mohole drilling program, reported in Washington, D. C. Seismologists had based this estimate on the velocity of sound waves through the layer.

Direct measurements in the well hole showed that sound actually traveled 1.3 miles per hour instead of the estimated one mile. The soft sediment layer represents a geologic span of 60,000,000 to 100,000,000 years.

The measurements were part of a drilling program known as Project Mohole, the eventual goal of which is to penetrate the earth's crust to the dense underlying rock mantle. The total cost of the program may run as high as \$15,000,000, Mr. Bascom said. A drilling rig that will make the final thrust to the earth's interior mantle is now on the drawing table.

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## MEDICINE

**Newborn Infants Harmed By Drugs Safe for Adults**

► NOVOBIOCIN, an antibiotic used to control a staphylococcal outbreak in an unnamed newborn nursery, caused an epidemic of apparent jaundice among the infants, two Cincinnati researchers report.

This is "one more example of the harm which may befall newborn and premature infants from the administration of a drug known to be safe for older subjects," an editorial in the *American Journal of Diseases of Children*, 101:411, 1961, states.

Dr. James M. Sutherland and William H. Keller of the University of Cincinnati report that one infant who received novobiocin died. Others got jaundice, but recovered (p. 447).

In experiments on newborn rats, the scientists also found a yellow skin discoloration following large doses of novobiocin.

Death, blindness and brain damage have resulted from untested administration to full-term or premature infants of certain other substances in addition to the newly discovered novobiocin danger.

The dangers from oxygen, sulfisoxazole, sulfadiazine, chloramphenicol and vitamin K were discovered by chance, the editorial pointed out. Drug houses and research laboratories have always tested new drugs, but usually only on animals and adult humans.

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# CE FIELDS

## MEDICINE

### "Moth-Eaten" Junctions In Myasthenia Patients

► IN PATIENTS with myasthenia gravis, a disease in which the muscles become progressively weaker, the junctions between nerves and muscles have a "moth-eaten" appearance when viewed under an electron microscope, scientists report.

Drs. S. I. Zacks, W. C. Bauer and J. M. Blumberg, working at the Armed Forces Institute of Pathology in Washington, D. C., have magnified the neuromuscular junctions of such patients 16,000 to 24,000 times and found that they appear to be abnormal in two ways.

The endplates, or jumping off place for a nerve impulse, are extensively disorganized, the investigators report. Certain parts of the nerve cell, the axon filaments, are shrunken and there are fewer of the finger-like projections known as secondary synaptic clefts. Those that remain are wider and more club-shaped than normal.

The second abnormality is that certain areas of the junction do not have the dense concentration of electrons seen in the normal state.

Myasthenia gravis long has been considered an impairment of conduction at the neuromuscular junction, but until now visible differences had not been noted. Just what each of these changes means in terms of muscle weakness is not now known, the scientists report in *Nature*, 190:280, 1961.

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## BIOLOGY

### Reptiles May Harbor Encephalitis Virus

► A CANADIAN scientist has found that the snakes, turtles, lizards and alligators of Okefenokee Swamp may be a virtual hotbed for encephalitis virus in the winter-time.

Eastern encephalitis, a disease usually confined to wild and domestic animals but sometimes found in man, may cause a high fever, paralysis or palsy, coma, delirium or abnormal heart function. About 50% of the children who get it die, and the infants who survive often suffer mental deterioration. Until now, scientists had few clues as to where the virus spends the winter.

Dr. Lars Karstad of Ontario Veterinary College in Guelph, Canada, has found that a number of the reptiles in the famed Georgia swamp have antibodies to the virus in their blood, an indication that the animals had been infected naturally. When the virus was injected into the animals, it spread through their bodies very fast and the infection lasted as long as 42 days, long enough to survive the winter.

He also found that reactions in individual

reptiles varied widely. Some built up no antibodies at all after infection with the virus, while others showed rapid rise in antibodies. Some of the reptiles could be reinfected and had the disease all over again.

Dr. Karstad reported at the 26th North American Wildlife and Natural Resources Conference meeting in Washington, D. C., that no one knows which insects may be carrying the disease from the reptiles to birds and mammals.

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## MEDICINE

### Fatal Heart Attacks in "Hearts Too Good to Die"

► A REASON why fatal heart attacks occur in "hearts too good to die" is proposed in the *Journal of the American Medical Association*, Vol. 176, 1961.

No recent heart damage was found in 316 out of 500 heart attack victims on whom autopsies were performed, Drs. Lester Adelson and William Hoffman of Western Reserve University School of Medicine, Cleveland, reported (p. 129).

When varying degrees of coronary narrowing produce different amounts of oxygen in different parts of the heart muscle, they said, this can create an electrical disturbance of sufficient magnitude to cause a fatal convulsive heart beat.

If a physician is present when such heart attacks occur, he may be able to revive the patient with cardiac massage, electrical defibrillation, or both, in association with artificial respiration, the scientists said.

The substitution of radiation treatment for surgery in patients with complicated duodenal ulcer has produced encouraging results, two other Cleveland physicians reported in the same journal.

Drs. Harold C. Klein and Norman E. Berman of Mount Sinai Hospital said 39 out of 50 patients treated with radiation were "cured" of their ulcer disease. Of the remaining patients, five avoided surgery, while six had to undergo operations (p. 98).

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## SEISMOLOGY

### Earthquake Recorded by Ocean Floor Instrument

► AN EARTHQUAKE has been recorded for the first time by an instrument placed on a deep ocean floor.

A seismograph resting on the Atlantic Ocean floor 120 miles from Bermuda recorded the earthquake at a depth of approximately three miles below the surface, Columbia University scientists said.

More sensitive recording of earthquakes and new knowledge of underwater sound transmission will be possible with the new missile-shaped instrument, John Ewing, Columbia University geophysicist and director of the project, said.

The spiked missile seismograph was built at Columbia's Lamont Geological Observatory.

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## BACTERIOLOGY

### Soil Specimens Yield Blastomyces Dermatitidis

► FOR THE FIRST TIME, *Blastomyces dermatitidis*, a species of fungus causing chronic infection that may be fatal, has been isolated from soil.

Although soil has been found to be the natural habitat for many of the fungi causing disease in man, all previous efforts to isolate this particular fungus from this source have failed.

The soil that yielded the positive specimen was collected in a tobacco-stripping barn near Lexington, Ky., in which a dog had died of blastomycosis two years previously. The soil sample was examined by means of a new technique at the Medical College of Georgia, Augusta.

Dr. J. Fred Denton, Medical College of Georgia, Dr. E. S. McDonough, Marquette University, Milwaukee, Wis., Dr. Libero Ajello, Communicable Disease Center, Atlanta, Ga, and Dr. Robert J. Ausherman, Del Tor Clinic, Lexington, Ky., report their findings in *Science*, 133:1126, 1961.

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## GEOLOGY

### New Timetable Made Of Earth's History

► A MORE ACCURATE timetable of the earth's history is now available.

The stages of evolution of plants and animals contained in earth's "book of sediments" can be dated more accurately with this revised geological time scale.

New evidence of rock ages resulting from the highly refined dating methods of rubidium and potassium "atomic clocks," and improved techniques of other dating methods, caused the revamping of the geological time scale, a calendar that stretches back through history at least 600,000,000 years.

Dr. J. Laurence Kulp, director of the geochemistry laboratory at Columbia University's Lamont Geological Observatory in Palisades, N. Y., reports the changes in *Science*, 133:1105, 1961.

The atomic clock dating of rocks measures the amount of radioactive decay of an element in a mineral. Because the decay follows a definite pattern, the age can be determined by the amount of the radioactive isotope residue.

Granite from Russia, sandstone from California and shale from Germany were dated by scientists. Dr. Kulp combined all the latest work of these scientists in presenting the new time scale.

The Mesozoic era, the age of reptiles when dinosaurs thundered over the earth, began about 230,000,000 years ago and ended 63,000,000 years ago. However, the dim beginnings when life first began on the earth is still unknown.

Earlier estimates on the ages when certain animals or plants predominated on the earth were fairly close to the present scale, Dr. Kulp notes.

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